

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Application of  
Kyo Young CHUNG

Serial No.: 10/646,688

Filed: August 25, 2003

Confirmation No.: 9966

EXPEDITED PROCEDURE  
UNDER 37 C.F.R. § 1.116

Group Art Unit: 2858

Examiner: V. Nguyen

Customer No.: 34610

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For SYSTEM AND METHOD FOR CLASSIFYING DEFECTS IN AND IDENTIFYING PROCESS PROBLEMS FOR  
AN ELECTRICAL CIRCUIT

U.S. Patent and Trademark Office  
Customer Window, Mail Stop AF  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Dear Sir:

Transmitted herewith is an Amendment and/or Reply in the above identified application.

No additional fee is required.  
 Also attached:

The fee has been calculated as shown below:

	NO. OF CLAIMS	HIGHEST PREVIOUSLY PAID FOR	EXTRA CLAIMS	RATE	FEE
Total Claims	48	48	0	x \$50.00 =	
Independent Claims	3	3	0	x \$200.00=	
If multiple claims newly presented, add \$360.00					
Fee for extension of time					
<b>TOTAL FEE DUE</b>					

Please charge my Deposit Account No. 16-0607 in the amount of \$. An additional copy of this transmittal sheet is submitted herewith.

A check in the amount of \$ \_\_\_\_\_ (Check #\_\_\_\_\_) is attached.

The Commissioner is hereby authorized to charge payment of any fees associated with this communication or credit any overpayment, to Deposit Account No. 16-0607, including any filing fees under 37 C.F.R. 1.16 for presentation of extra claims and any patent application processing fees under 37 C.F.R. 1.17.

Respectfully submitted,  
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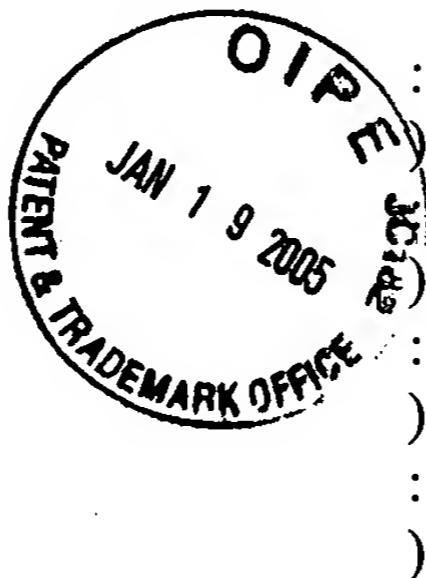
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In re patent application of

CHUNG, Kyo Young

Serial No. 10/646,688

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Confirmation No. 9966

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Group Art Unit: 2858

Customer No. 34610

For: SYSTEM AND METHOD FOR CLASSIFYING DEFECTS IN AND IDENTIFYING  
PROCESS PROBLEMS FOR AN ELECTRICAL CIRCUIT

**REQUEST FOR RECONSIDERATION UNDER 37 CFR § 1.116**

U.S. Patent and Trademark Office  
Customer Service Window, Mail Stop AF  
Randolph Building  
401 Dulany Street  
Alexandria, Virginia 22314

Sir:

The following amendments and remarks are submitted in response to the Final Office Action mailed on December 1, 2004 in connection with the above-identified application.

Claims 1-48 are pending.

In the Final Office Action, the Examiner maintained the rejection of claims 1, 2, 9-12, 16, 17, 22-24, and 27-36 were rejected under 35 USC § 103(a) for being obvious in view of the Ichioka patent. Applicant respectfully submits that this rejection is improper for the following reasons.

In the Amendment filed on November 3, 2004, Applicant identified at least three reasons why Ichioka is legally insufficient for purposes of establishing a *prima facie* case of obviousness of claim 1.

1) The Ichioka patent does not teach or suggest "identifying a problem in a manufacturing process which caused the defect based on said defect classification."

2) The Examiner has failed to cite a reference that teaches or suggests modifying the Ichioka patent to perform the step of identifying a problem in a manufacturing process which caused the defect based on said defect classification.

3) The test for determining obviousness (capable of changed functionality) proposed by the Examiner is improper for determining unpatentability under 35 USC § 103(a).

The Examiner has failed to provide a proper legal ground to refute any of these reasons. In fact, the Examiner has agreed with reason 1) that Ichioka does not teach or suggest the identifying step. (See page 2 of the Final Office Action). Applicant requests the Examiner to reconsider the propriety of the § 103(a) rejection for these and the following additional reasons.

In the Final Office Action, the Examiner acknowledged that Ichioka does not disclose the identifying step of claim 1. Notwithstanding this omission, the Examiner maintained the rejection on grounds that this step “does not have to be expressly stated in the prior art because it is *logically* to identify a problem which causes the defect after the step of classifying a defect in the circuit.” Applicant respectfully submits that this is an improper reason to maintain the § 103(a) rejection.

Contrary to the Examiner’s statement, the proper test for establishing a *prima facie* case of obviousness requires the Examiner to show that the identifying step is expressly included in the prior art. See, for example, MPEP § 2142 *et seq*, which provides that the first requirement for establishing a *prima facie* case of obviousness is to show that the cited references teach or suggest all the features in a claim. See also *In re Rouffet*, 47 USPQ.2d 1459 (Fed. Cir. 1997). The Examiner has failed to cite even one reference that teaches or suggest the identifying step of claim 1.

To make up for this deficiency, the Examiner merely stated that it would have been logical to include such a step in the method disclosed in the Ichioka patent. Merely stating that it would have been *logical* to modify a cited reference to include a step missing from a method claim does not satisfy the legal test for establishing obviousness under § 103(a). Rather, to satisfy this test the Examiner must show: (1) the identifying step of claim 1 was known in the prior art at the time the claimed invention was made; and (2) some teaching or suggestion was in existence at that time that would have led one of ordinary skill in the art to modify the Ichioka patent to include this step. The Examiner has failed to make either showing.

Moreover, the Examiner statement that it would merely have been logical to include the identifying step of claim 1 in the Ichioka method amounts to nothing more than a gratuitous assertion. As repeatedly emphasized by the Federal Circuit, such an assertion cannot properly be used as a replacement for satisfying the requirements for establishing a *prima facie* case of obviousness. *In re Fine*, 5 USPQ.2d 1596 (Fed. Cir. 1998)(The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art). See also *In re Dembicza*k, 50 USPQ.2d 1614, 1617 (Fed. Cir. 1999)(Broad conclusory statements standing alone do not constitute “evidence” sufficient to satisfy the burden of establishing a *prima facie* case of obviousness).

Stating that it would have been *logical* to include the identifying step of claim 1 in the Ichioka patent, at best, constitutes a subjective belief that such a feature was in the prior art at the time the claimed invention was made. As noted by the Federal Circuit in *Fine*, such a subjective belief cannot serve as a basis for satisfying the PTO’s burden of establishing a *prima facie* case of

obviousness based on objective evidence.<sup>1</sup> The Examiner has not cited a reference or any other form of objective evidence to satisfy this burden. Accordingly, the rejection must be considered legally improper.

In the Final Office Action, the Examiner attempted to provide a justification for the rejection. At page 7, the Examiner referenced column 1, lines 65-67, and column 2, lines 27-47, of the Ichioka patent. These portions of Ichioka merely disclose classifying defects. They do not make any mention whatsoever of identifying a manufacturing problem that may have been the cause of the defect.

The Examiner further stated, on page 7, that by looking at the parameters in Figs. 6-9 and 12 of Ichioka, one “can determine” the cause of the defect. This words “can determine” do not constitute any objective teaching in the art and therefore cannot serve as a legitimate basis for underlying a § 103(a) rejection.

Moreover, whether or not an invention is “capable of” being modified to include a claimed feature is completely irrelevant to an obviousness inquiry, unless that capability is supported by objective evidence in the prior art. See MPEP § 2143.01, which states: “the mere fact that references can be . . . modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” The Examiner has offered no objective evidence to support his assertions. Therefore, whether or not Ichioka is capable of including the identifying step of claim 1 is not germane to the instant obviousness inquiry.

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<sup>1</sup> Moreover, the Federal Circuit indicated in *Fine* that “obvious to try” is not the proper standard for determining obviousness under § 103(a). Rather, the Examiner must show that all the features of a claim were in the prior art. Otherwise, a *prima facie* case of obviousness cannot be satisfied.

Applicant further brings to the Examiner's attention that the present § 103(a) rejection is based on a single reference. Regarding such a rejection, the Federal Circuit has stated: "Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference" to achieve the claimed invention. In rejecting claim 1, the Examiner merely subjectively asserted that it would have been logical to modify Ichioka to include the step of "identifying a problem in a manufacturing process which caused the defect based on said defect classification." Such an assertion, without any supporting objective evidence, cannot form the basis of a proper § 103(a) rejection, especially when that rejection is based on a single reference.

In addition to the foregoing, Applicant respectfully submits that the Examiner has overlooked the importance of the identifying step of claim 1. This step not only requires identification of a manufacturing problem which caused a defect, that identification is performed based on the defect classification performed earlier in the claim. This is an especially advantageous feature of the invention which cannot be achieved by employing the Ichioka method. See, for example, page 30 of the specification, which provides:

The Inventor has recognized that when a defect is detected and/or located during a manufacturing process of an electrical circuit, access to statistical information showing a distribution of one or more process problems that likely caused the defect would be highly desirable. *The present invention provides access to this information based on process problem data collected over time. Using this data, process problems can be monitored in different units of time (e.g., weekly or monthly) and corrective action may be taken to improve the accuracy and efficiency of the manufacturing process.* (Emphasis added)(Page 30).

The Ichioka patent does not teach or suggest identifying a problem in a manufacturing process that caused a circuit defect. On the contrary, once a defect is determined Ichioka endorses either discarding the circuit or taking some action to correct the defect. Neither Ichioka nor any other reference of record teaches or suggests performing the further step of determining what the cause of the defect was during the manufacturing process, and then tailoring the corrective action to overcome that particular manufacturing process problem. Absent a teaching or suggestion of these features, it is respectfully submitted that the Ichioka patent cannot render obvious claim 1.

For at least the foregoing reasons, it is respectfully submitted that the § 103(a) rejection of claim 1 and its dependent claims is improper and should be withdrawn. It is further submitted that claims 22 and 30 are allowable over Ichioka, as these claims respectively recite “identifying a manufacturing process problem which caused the defect based on said defect classification” and “a processor which . . . identifies a problem in a manufacturing process which caused the defect based on said defect classification.” None of these features are taught or suggested in Ichioka or the other cited references, whether taken alone or in combination.

Claim 9 depends from claim 1 and recites “adjusting said process to avoid the problem during manufacture of other circuits.” That is, for example, once the manufacturing problem that caused the defect has been identified, the process is then adjusted to avoid the problem. These features are not taught or suggested in any of cited references, whether taken alone or in combination.

Claim 28 recites “storing information linking the different defect types to manufacturing process problems, said identifying step including identifying said manufacturing process problem

based on said linking information.” None of the cited references teach or suggest this linking information or any of the other features recited in claim 28.

Claim 29 recites “identifying an area within said manufacturing process where the classified defect occurred.” These features are not taught or suggested by any of the cited references, whether taken alone or in combination.

Claim 35 recites “a memory which stores information linking a plurality of defect classifications with a respective plurality of manufacturing process problems, said processor identifying the manufacturing process problem based on said linking information.” None of the cited references teach or suggest this linking information or any of the other features recited in claim 28.

Claim 36 recites “wherein the processor identifies an area within said manufacturing process where the classified defect occurred.” These features are not taught or suggested by any of the cited references, whether taken alone or in combination.

The Examiner rejected claims 2-8 for being obvious over the above-identified combination. Applicant traverses this rejection for the following reasons.

Claims 2-8 depend from claim 1. In order to render claims 2-8 obvious, the Suzuki patent must therefore teach or suggest the features of claim 1 missing from Ichioka. The Suzuki patent discloses a decision circuit that detects pixel faults based on the voltage stored in a capacitor. The Suzuki patent does not teach or suggest the step of “identifying a problem in a manufacturing process which caused the defect based on said defect classification.” Absent a teaching or suggestion of these features, it is respectfully submitted that a Ichioka-Suzuki combination cannot render claim 1 or claims 2-8 obvious. Withdrawal of the § 103(a) rejection is therefore respectfully requested.

The Examiner rejected claims 37-48 under 35 USC § 103(a) for being obvious in view of a Ichioka-Takagi combination. This rejection is respectfully traversed for the following reasons.

Claim 37 recites that the problem in the manufacturing process is identified by comparing the defect classification to statistical information which links a plurality of predefined defect classifications to a plurality of corresponding manufacturing process problems. The Takagi patent discloses a system which optically inspects an object, determines whether the object has a defect by processing an image, and then determines a cause of the defect. The object is a semiconductor substrate containing a circuit.

In order to render claim 37 obvious, there must be some teaching or suggestion in the art to support combining Ichioka with Takagi. No such teaching or suggestion exists. The Takagi method employs an optical technique which performs defect classification by processing image information. The Ichioka method, on the other hand, performs defect classification based on examination of electrical test signals. Modifying Ichioka to include the Takagi processor would therefore produce an **inoperable result**, because the Takagi processor which only performs optical/image analysis would not be able to process the electrical test signals generated by the Ichioka patent, for purposes of performing defect and cause classification. As noted in MPEP 2143, any combination of references which produces an inoperable result is improper for purposes of rejecting a claim under 35 USC § 103(a).

For at least these reasons, it is respectfully submitted that the rejection of claim 37 based on a Ichioka-Takagi combination is improper and should be withdrawn. The same rationale may be applied to claims 38-48 to thereby warrant the allowability of these claims.

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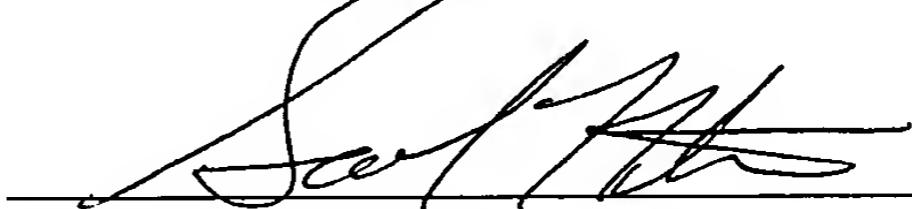
Reconsideration and withdrawal of all the rejections and objections made by the Examiner is hereby respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is respectfully requested.

Should the Examiner believe that further amendments are necessary to place the application in condition for allowance, or if the Examiner believes that a personal interview would be advantageous in order to more expeditiously resolve any remaining issues, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with this application, including extension of time fees, to Deposit Account No. 16-0607 and credit any excess fees to the same Deposit Account.

Respectfully submitted,



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